Multivariate Analysis in Applied Psychological Research

Primera Casa (PC) 416

Wednesday 9am – 11:45am

Instructor  Stefany Coxe, Ph.D.

Office:  DM 275
Office hours:  by appointment
Email:  stefany.coxe@fiu.edu
Website:  http://faculty.fiu.edu/~scoxe

Course Description
Basic techniques of multivariate analysis, emphasizing the rationale and applications to psychological research. Includes multiple regression, MANOVA, principal component analysis, and factor analysis.

Goals of the Course:  (1) Familiarize you with classic multivariate statistics, (2) Make sure that you understand how to perform these analyses using statistical software, (3) Give you background to understand current applied statistics research in Psychology, (4) Prepare you for further study in applied statistics in Psychology

Statistical Background
Graduate coursework covering analysis of variance (ANOVA) and linear regression. We will cover a variety of topics in this course, but all of them build on a basic general linear model (ANOVA and regression) framework. I do not expect you to have taken SEM or other advanced courses.

Textbook
Not required, but a good additional perspective on the topics. Also easy to read and inexpensive. 
Other readings:  I will post relevant articles to Blackboard on an as-needed basis.

Software
We will use both SPSS and SAS in this course. Each package has strengths and weaknesses, so you will want at least a basic understanding of both. I will provide you with information to get started in SPSS and SAS, as well as information about specific procedures / analyses we will cover in this class. You will need to access either SPSS or SAS outside of class to complete homework assignments.

Blackboard
Course materials (lecture notes, computer code, and assignments) will be posted on the Blackboard site for the course. You should bring lecture notes and other materials to class. Please note that the lecture notes are not complete – you will also need to take notes in class and even consult readings.

Teaching Assistant  Our teaching assistant is Kelly Cromer, a 3rd year Clinical Psychology Ph.D. student. You can contact Kelly at kcromer@fiu.edu
Assignments

Homework

- Homework assignments due by midnight on Tuesday (the night before class)
- Almost weekly (12 assignments)
- You will need to access SPSS and/or SAS to complete most homework assignments
- You may also need to do some mathematical calculations by hand

Quizzes

- In-class quizzes approximately every three weeks (see Course Outline, 5 quizzes)
- I will give you output or other information and you will need to interpret or annotate the results or otherwise comment on the material
- You may have to do some mathematical calculations, but they will be minimal
- You will NOT need to run analyses in SPSS or SAS
- You will have 1 hour to complete each quiz before lecture, so it is in your interest to be punctual!

Grading

Final Grade

Your final grade is the weighted average of all your assignments
Homework: 60% of total grade
Quizzes: 40% of total grade

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>&gt;= 93</td>
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<tr>
<td>A-</td>
<td>90 - 92.99</td>
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<td>C+</td>
<td>77 - 79.99</td>
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<td>C</td>
<td>73 - 76.99</td>
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There are no plans for any make-up assignments or activities.
Course and University Policies

Attendance and Late Policy

- I shouldn’t have to tell you to attend every class. This is graduate school.

- Assignments are late if they are turned in after the due date and time. A 5 point late penalty will be deducted for each 24 hour period late — maximum score of 95/100 if 1 day late, maximum score of 90/100 if 2 days late, etc.

- Legitimate, verifiable cases of illness and emergencies, religious holy days, and conference travel can be accommodated. You need to contact me as soon as possible to make arrangements.

Drop Dates
Monday, August 29: Last day to drop courses or withdraw from the University without incurring financial liability for tuition and fees
Monday, October 31: Deadline to drop a course with a DR grade

Special Needs
Any student with a disability or other special need that may require special accommodations for this course should make this known to the instructor during the first week of class.

Disability Resource Center
Graham Center (GC) 190
(305) 348-3532
drcupgl@fiu.edu
drc.fiu.edu

Academic Misconduct
Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and to honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

Academic Dishonesty
Please refer to your student handbook for a description of what constitutes academic dishonesty.

NOTE: Anything on this syllabus is subject to change at the Instructors discretion.
### Tentative Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>HW due</th>
<th>Quiz</th>
<th>Readings</th>
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<tbody>
<tr>
<td>1</td>
<td>Aug 24</td>
<td>Introduction, Matrix algebra 1</td>
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<td>1, 2, S1</td>
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<td>2</td>
<td>Aug 31</td>
<td>Software, linear regression</td>
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<td>3</td>
<td>Sept 07</td>
<td>Linear regression (matrix)</td>
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<td>Sept 14</td>
<td>Linear regression (matrix)</td>
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<td>Sept 21</td>
<td>Analysis of covariance (ANCOVA)</td>
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<td>Sept 28</td>
<td>Maximum likelihood</td>
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<td>2</td>
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<td>Oct 12</td>
<td>Matrix algebra 2</td>
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<td>Oct 19</td>
<td>Principal components analysis (PCA)</td>
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<td>3</td>
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<td>Repeated measures ANOVA</td>
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<td>Dec 07</td>
<td>FINALS WEEK</td>
<td>12</td>
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Readings are chapters from the Harlow textbook, unless otherwise indicated
S1 = Supplement 1: Tabachnick & Fidell, Appendix 1
S2 = Supplement 2: Enders (2005)
S3 = Supplement 3: Baraldi & Enders (2010)
Extended Reading list

Do not try to read all of these articles and books. These are additional resources if you want to learn more about a specific topic. I used many of these resources when developing the course.

**General multivariate statistics and linear regression textbooks**


**Matrix algebra**


**Analysis of covariance**


Maximum likelihood


Missing data


Principal components analysis (PCA) and factor analysis (FA)


Multivariate analysis of variance (MANOVA)


Repeate measures ANOVA


Mixed / multilevel models


